

Extensible Markup Language

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14 October 1999***

Why are we talking about XML

XML is emerging as the
de facto language for
defining business data for
business to business
commerce on the Internet



Outline

- ◆ XML Defined
- ◆ XML Architecture
- ◆ XML Technical Specifications
- ◆ What XML Is Not
- ◆ XML Business Standardization Initiatives
- ◆ Deciding on XML



Extensible Markup Language Defined

- ◆ XML is a series of related technical specifications that provide a ***syntax*** for identifying, exchanging, and displaying data
- ◆ XML specifications are designed for data exchanges using Web transfer protocols between connection nodes -
and between the connection nodes and the originator/receiver of the data



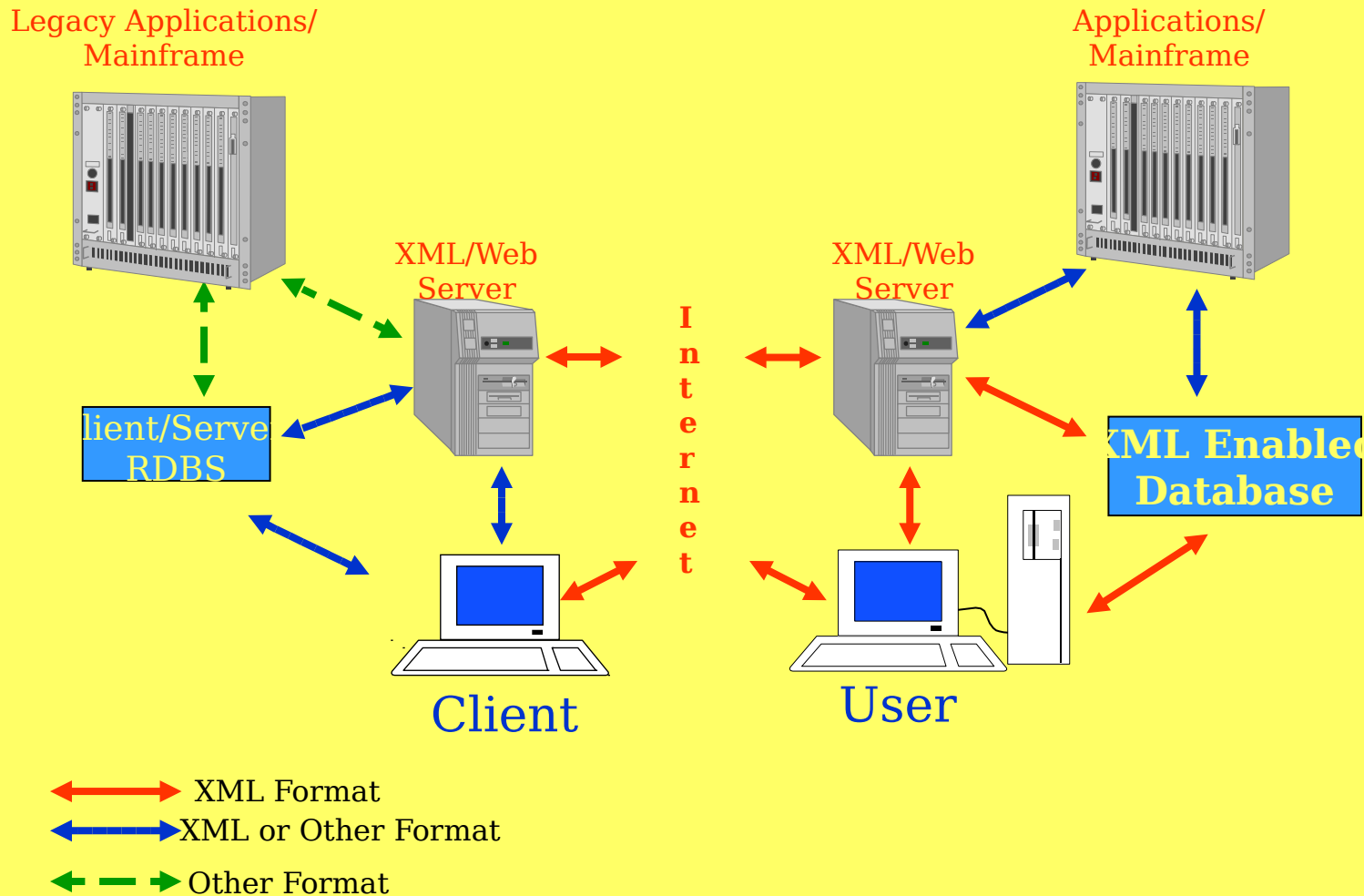
The Extensible Markup

Language Is -

- ◆ A subset of the Standard Generalized Markup Language (ISO Standard 8879)
- ◆ A series of technical specifications
- ◆ A flexible and extensible method for marking and exchanging data in a web environment
- ◆ A method for incorporating modeling in web applications
- ◆ A method for creating web based distributed computing environments for internal and external applications



XML Architecture



XML Architecture - The Pieces

- ◆ Authoring Tools
- ◆ Databases
- ◆ Browsers
- ◆ XML Application Servers
 - Parser
 - Middleware for Application & Metadata
 - » Remote Procedure Call (RPC)
 - » Message Oriented Middleware (MOM)
- ◆ Business Object Libraries
- ◆ XML/EDI Engine



XML Document Instance

Processing Instruction

- XML Version
- Encoding Information
- File Reference(s)

Document Type Definition

- Description of Structure
 - Order (Looping)
Sequence
 - Tag Relationships

XML Document

- Entities (Objects)
 - Elements
 - Attributes



DTD Declarations

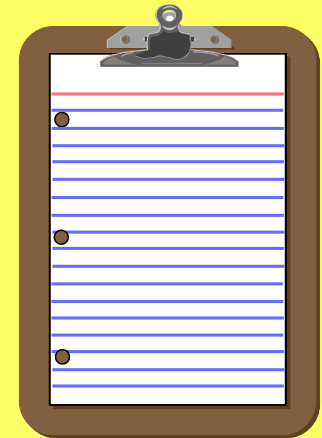
Declaration	Function
Element	Indicates the declaration contains a model that constrains the permitted contents of a particular element
ATTLIST	Indicates the declaration defines the names, permitted values/types and default values of a list of attributes that are to be associated with the named element
Entity	Indicates the declaration contains either the replacement text, or a pointer to a file containing the replacement text, that is to be used to replace a named entity reference within messages associated with the DTD
Notation	Indicates the declaration assigns a locally significant notation name to a process managed by a resource whose location is defined as part of the notation declaration.



An XML Example - DTD

Subset

```
<!ELEMENT officesupplies (writinginstruments) *>
<!ELEMENT writinginstruments (manufacturer, lead
eraserindicator, packaging, price, sku) >
<!ATTLIST writinginstruments type CDATA #REQUIRED>
<!ELEMENT manufacturer (#PCDATA)>
<!ELEMENT lead (#PCDATA)>
<!ELEMENT eraserindicator (#PCDATA)>
<ELEMENT packaging (#PCDATA)>
<!ELEMENT price (#PCDATA)>
<!ELEMENT sku (#PCDATA)>
```



XML Tags

Tag Type	Description
<Start Tag>	Used to define the start of an individual XML element. Start tags are always required. A start tag is indicated by the character < followed by a descriptive name and a closing character.
<End Tag >	Used to define the end of an individual XML element. An end tag is identified by the characters </ followed by a describing name and a closing character >. End tags are optional, but must be present to have a well formed document.
<Start Tag: Attributes>	Used to attach additional information to an element. Attributes describe characteristics of an element, to include outside standards references. Attributes can only occur in start and empty elements.
<Empty Element Tags>	Used to identify an empty element. Empty elements are used for illustrations, figures, and other graphic data types.



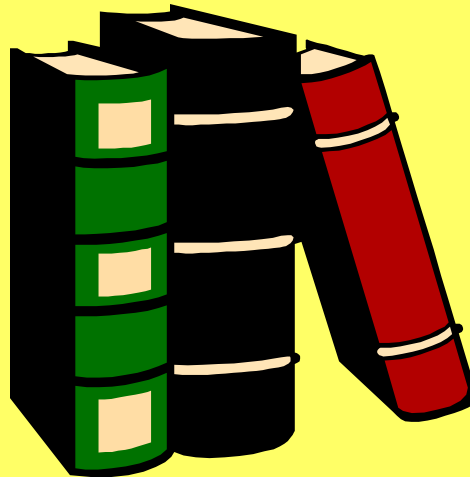
An XML Example - Data

```
<!--this file represents a fragment of a catalog database -->
<officesupplies>
  <writinginstrument type="pencil:wooden">
    <manufacturer>Sharp
      <lead>#3 Soft
        <eraserindicator>Yes</eraserindicator>
        <packaging>Dozen</packaging>
        <price>.75</price>
        <sku>23475</sku>
      </lead>
      <lead>#2 Hard
        <eraserIndicator>No</eraserindicator>
        <packaging>Gross</packaging>
        <price>9.75</price>
        <sku>23476</sku>
      </lead>
    </manufacturer>
  </writinginstruments>
</officesupplies>
```



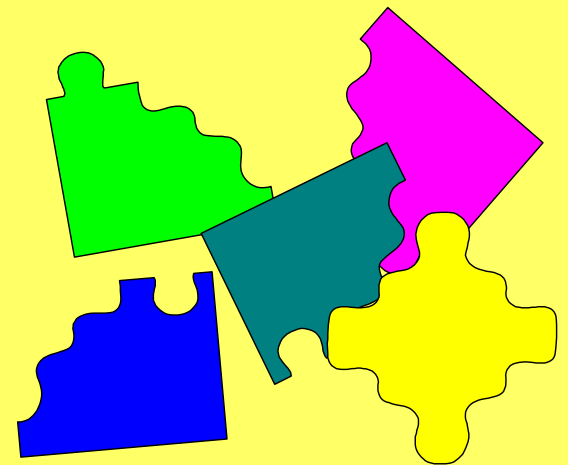
XML Technical Specifications

- ◆ Are developed by the World Wide Web Consortium (W3C)
- ◆ Issued as W3C recommendations
- ◆ Not submitted to standards bodies



XML Technical Specifications

- ◆ **Approved Recommendations**
 - XML 1.0
 - Document Object Model Level 1
 - Namespaces in XML
 - Associating Stylesheets with XML documents
- ◆ **Proposed Recommendations**
 - Resource Description Framework (RDF) Schemas
- ◆ **Working Drafts**
 - XML Information Set
 - XML Schema Part 1: Structures
 - XML Schema Part 2: Datatypes
 - Extensible Stylesheet Language
 - Document Object Model Level 2



What XML Is Not -

- ◆ XML is not a business standard
- ◆ The XML technical specifications do not:
 - Contain agreed upon tag identifiers
 - Contain agreed upon data elements
 - Contain agreed upon document structures
 - Contain agreed upon document contents
 - Contain agreed upon exchange requirements



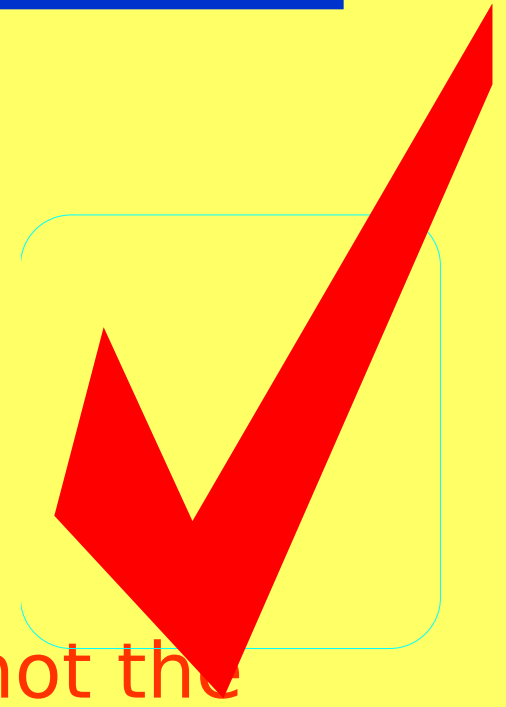
Business Standardization Initiatives

- ◆ CommerceNet
- ◆ RosettaNet
- ◆ BizTalk
- ◆ OASIS
- ◆ XML/EDI
- ◆ European Committee for Standardization
- ◆ ebXML
- ◆ Many other industry, supply chain, enterprise level efforts

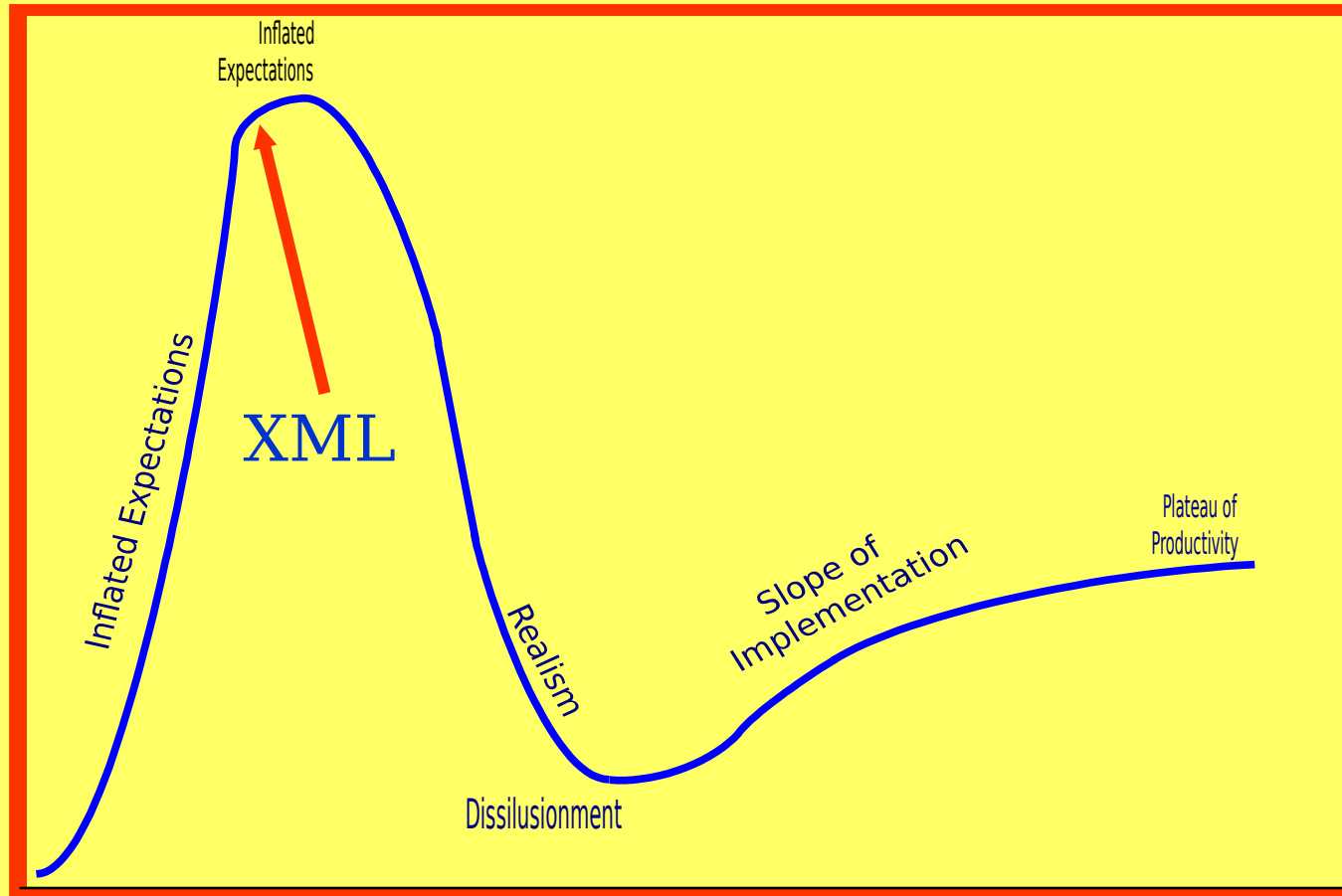


XML Advantages

- ◆ Extensibility
- ◆ License-free
- ◆ Platform independent
- ◆ Web architecture based
- ◆ Distributed Web Computing
- ◆ Expanding EDI (The concept not the standard)
- ◆ Data searching



Technology Cycle

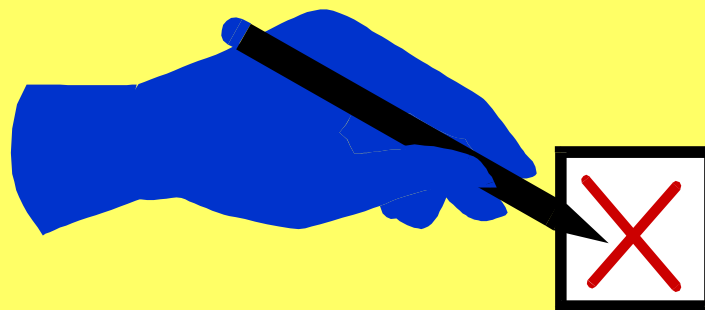


Source: Gartner Group



XML Drawbacks

- ◆ Immature Technical Specifications
- ◆ Competing Immature Business Standards
- ◆ Immature Tools
- ◆ Legacy Standards



XML Implementation

Issues

- ◆ **Technical specifications** -
 - Not yet mature
- ◆ **Business standards** -
 - Universal agreement to developing business standards does not exist
 - Fragmentation is significant
 - Implementers are chasing technology tail and do not have clear focus
- ◆ **Architecture** -
 - XML can integrate with backend non-XML applications and databases, but Web architecture and XML enabled applications/databases are required to take full advantage



XML Implementation

Issues

What about Style Sheets?

DTD or Schema?

Whose Responsibility?

What Standard?

What Repository?

Digital Signatures?

What Version?

Process Improvement?

User Involvement?

Server Compatibility?



XML or HTML

Situation	Solution
Data consist of simple pages and graphics	HTML
Data remain relatively static	HTML
Data primarily multimedia - sound and/or video	HTML
Data viewed on variety of different platforms	XML
Data require advanced searching	XML
Data interfaced between different machines or database engines	XML
Users not finding data they need	XML



XML or EDI

Situation	Solution
Trading Partners EDI enabled	EDI
High Volume Batch Processing	EDI
XML Standards and Specifications do not support process	EDI
Trading Partners do not have application/database	XML
Trading Partners want to use Web	XML
Agency Moving to Web Architecture	XML
Real Time Processing	XML
Data used for both User to Machine and Machine to Machine	XML



BARRIERS TO XML IMPLEMENTATION

- ◆ Statutory - need to use recognized standards
- ◆ Regulatory - FIPS 161-2
- ◆ Policies/procedures - generally aligned
- ◆ Procedures for use - generally not developed
- ◆ Architecture - not yet web focused
- ◆ No clear DoD focus



XML CONCLUSIONS

- ◆ Provides new opportunities
- ◆ Premature to migrate existing EC now
- ◆ No central agreed-upon business standards body to control and direct XML expansion of web-based EDI



XML CONCLUSIONS

(Continued)

- ◆ Need to consolidate XML development leadership
- ◆ Need to develop a comprehensive organizational strategy
- ◆ Federal government should take a leading role and work with XML standards and technical specification developers



RECOMMENDATIONS

The key to electronic business success using XML is business process reengineering (BPR) -

New technologies do not streamline functional operations and processes

